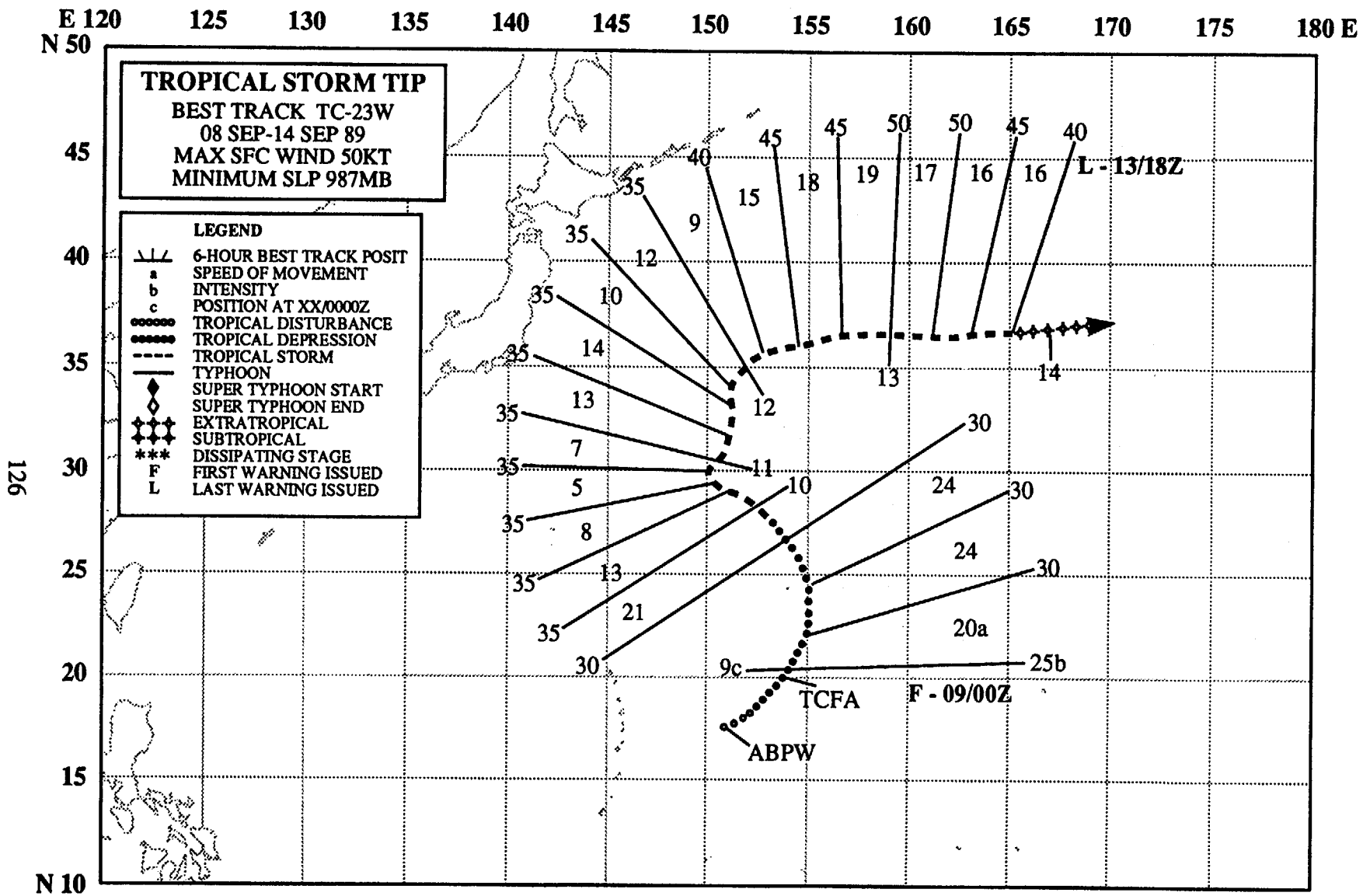
TROPICAL STORM TIP
BEST TRACK TC-23W
08 SEP-14 SEP 89
MAX SFC WIND 50KT
MINIMUM SLP 987MB
LEGEND
6-HOUR BEST TRACK POSIT
a SPEED OF MOVEMENT
b INTENSITY
c POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
*** DISSIPATING STAGE
F FIRST WARNING ISSUED
L LAST WARNING ISSUED
E 120
125
130
135
140
145
150
155
160
165
170
175
180 E
N 50
45
40
35
30
25
20
15
N 10
126
L - 13/18Z
F - 09/00Z
TCFA
ABPW

TROPICAL STORM TIP (23W)

Generating in early September at the eastern end of the monsoon trough, Tip executed an unusual track to the northeast, then recurved after moving northwestward around the subtropical ridge, and finally tracked eastward with the polar westerlies. Tip reached its peak intensity at 37° north latitude two days after recurvature.

Tip developed east of the Mariana Islands in an area of enhanced convection at the eastern-most extension of the southwest monsoon. At 080600Z, JTWC mentioned the area on the Significant Tropical Weather Advisory as having fair potential for further development. Increases in the amount, depth, and organization of the convection caused JTWC to issue a Tropical Cyclone Formation Alert at 082300Z. With synoptic data supporting a closed low-level circulation and indicating 25 kt (13 m/s) sustained surface winds, JTWC issued the first warning on Tropical Depression 23W.

During the time that the depression moved rapidly northeastward, and then northwestward, the "spin-up" of the system was slow, partially due to the large size of the vortex. By the time Tip reached the axis of the subtropical ridge and slowed late on 10 September, the bulk of the supporting convection from the monsoonal flow had moved away to the east and north, and had dissipated, leaving only a small ragged patch of dense overcast near the partially exposed low-level circulation center.

At 110600Z, Tip (Figure 3-23-1) began

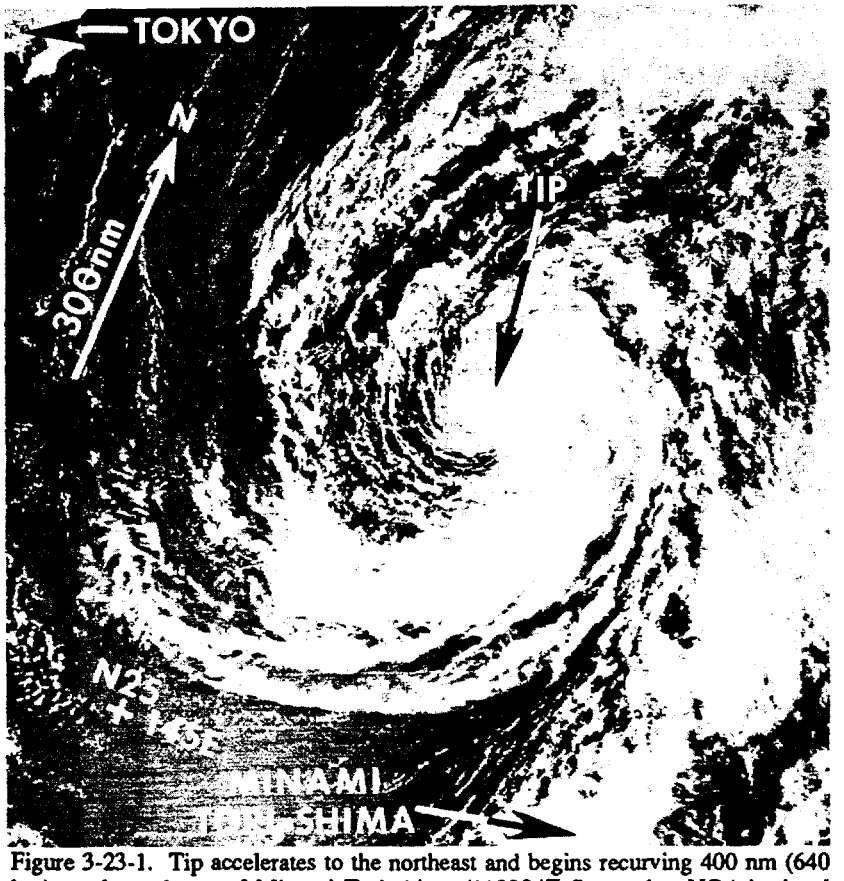

Figure 3-23-1. Tip accelerates to the northeast and begins recurving 400 nm (640 km) north-northeast of Minami Tori-shima (110324Z September NOAA visual imagery).

to accelerate to the north-northeast. During the next 18 hours, Tip appeared to be undergoing extratropical transition, but, at 120000Z, the tropical cyclone regained enough of its central convection to maintain its warm core. This additional translational effect from the acceleration assisted Tip in reaching its peak intensity of 50 kt (26 m/sec) at 130000Z.

During the early morning hours of the 13 September, Tip's convection tracked south-southeastward with the upper-level flow. Daylight satellite imagery revealed that the low-level circulation was well to the north of the convection. At 131800Z, JTWC issued the final warning on Tropical Storm Tip and passed warning responsibility for the extratropical gales to the Naval Western Oceanography Center at Pearl Harbor, Hawaii.